Public Consultation

10 March 2020

Public Consultation on draft ETS State Aid Guidelines

This document represents the response of Eurometaux, the European non-ferrous metals association, to the draft ETS Guidelines published on the 14 January[1]. The document begins in section one by outlining our reaction on the 5 key issues we previously commented consultation responses (Inception impact assessment, public consultation and targeted consultation). These areas are 1) eligibility, 2) level of Aid, 3) regional pass-through factors, 4) conditionality and 5) benchmarks. We then in section two outline positive elements in the draft Guidelines which should remain in the final Guidelines. Section three gives a short of assessment of other outstanding issues. Elsewhere, with regards the pass-through factors, it should be noted that all this information is supplemented by an attached memo where we provide additional background information of why the geographical regions in the draft Guidelines should be altered.

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[1] https://ec.europa.eu/competition/consultations/2020_ets_stateaid_guidelines/draft_ets_guidelines_en.pdf

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

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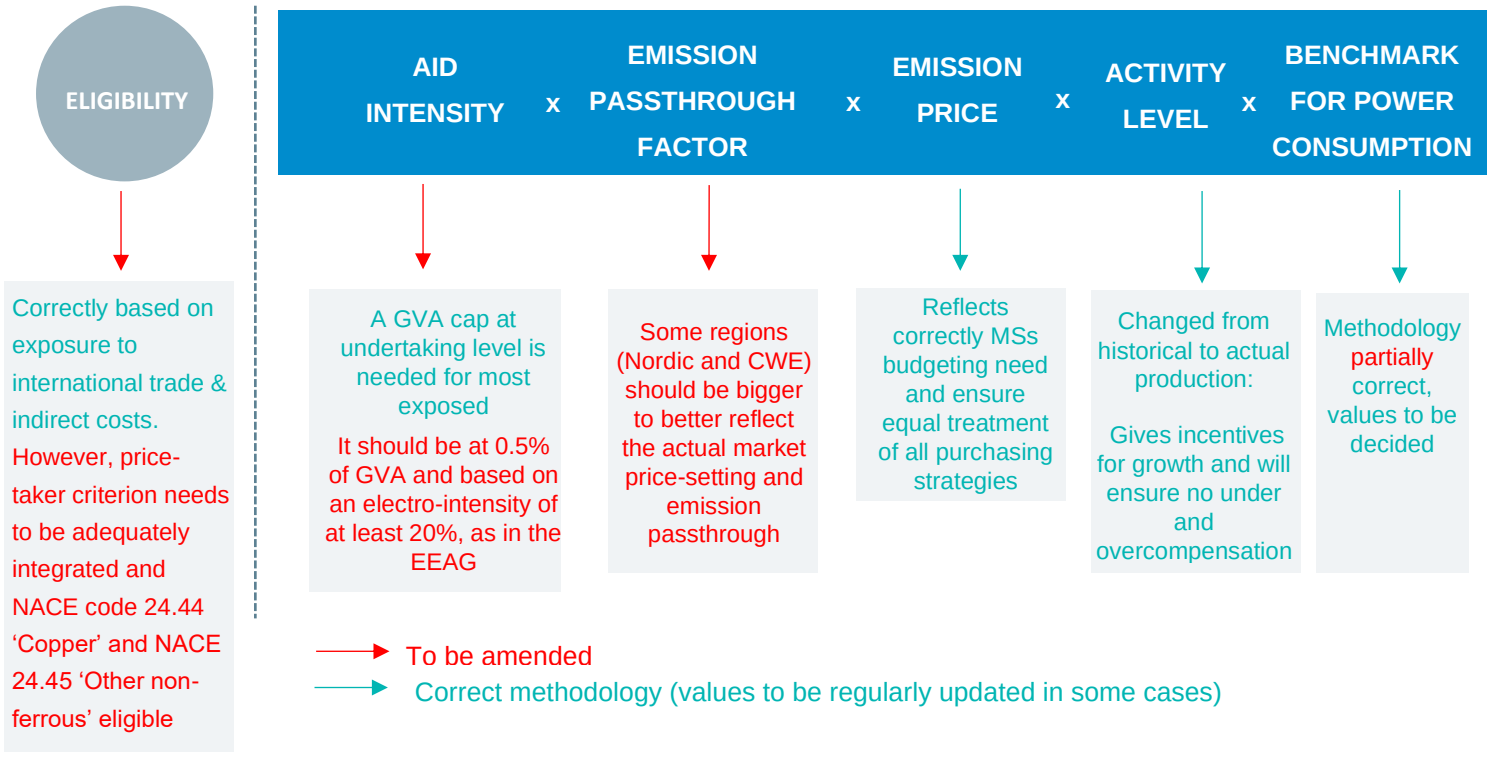
1. Assessment in the 5 Key Issues

In this section, we give the reaction of the European Non-Ferrous Metals industry in the following key issues of the revision: a) eligibility, b) level of compensation, c) regional pass through factors, d) conditionality and e) benchmarks.



a) Eligibility

As outlined in our previous consultation responses, we believe that as a principle, industries where product prices are set globally (i.e. price-taker industries) and where electricity costs represent a major factor, should automatically be on the list of eligible sectors for compensation. We agree with the Commission's proposal that the list should be established based on the economic situation of the relevant sectors, considering two factors: 1) exposure to international commercial activity – with the price-taker criteria factored into this calculation and 2) exposure to indirect ETS costs being most relevant. aboveabove

However, in the draft Guidelines, NACE 24.44 Copper production and NACE 24.45 'Other non-ferrous metals production' are not currently in the list of eligible sectors in Annex I but instead as one of the four sectors placed at a "medium risk" of carbon leakage where the Commission would like to do a further qualitative evaluation. In its evaluation note[2], DG Competition notes that *"The Commission may decide to include additional sectors, in light of the feedback and evidence received in the public consultation, based on qualitative considerations provided the sectors concerned have at least an*

[2] Explanatory note accompanying the proposal for the revision of the Guidelines: https://ec.europa.eu/competition/consultations/2020_ets_stateaid_guidelines/explanatory_note_en.pdf

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Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

indirect carbon leakage indicator of 0.2 and that their carbon leakage risk as evaluated by the consultant in the study is at least medium".

Both sectors - **Copper & Nickel** -, via the European Copper Institute and Nickel Institute will be making written submissions with further evidence on their carbon leakage exposure. **As electro-intensive price taker industries, both sectors are highly exposed to carbon leakage and thus should be added to the list of eligible sectors in the final published Guidelines**[3]. Elsewhere, it should be noted that both copper and other non-ferrous, through their products, as key materials for the energy climate transition[4]. These metals facilitate GHG emission reductions in numerous other sectors, from renewable energy systems, through energy efficient end-use appliances to electrified transport, heating and cooling systems. They are also a key material in battery production, a strategic priority of the European Commission.

b) Level of compensation

The relative importance of indirect ETS costs for a sector or company should be decisive for the level of compensation. The proportionality of aid needed to achieve the objectives of the Guidelines (preventing carbon leakage) will vary between eligible sectors and undertakings depending on the magnitude of indirect costs. Positively, the draft Guidelines has correctly understood this and come with targeted aid.

Paragraph 26 of the draft Guidelines say that at the sectoral level, the level of compensation will be 75% until 2030. While Eurometaux has asked for 85% compensation, a system of 75% compensation, provided a GVA limitation is also included, is a reasonable level of compensation.

As noted by Eurometaux, in our consultation responses (i.e., inception impact assessment, public consultation and targeted consultation), degressive aid serves no function. Instead, the best way to capture improvements in an installations performance and decarbonisation of the power are to update the benchmark values; Commission explanatory note says that it "*considers that this update of the efficiency benchmarks is better suited to capture any potential efficiency gains in the sectors concerned than a per-se reduction of the aid intensity".* We agree with the Commission's assessment that aid intensity should be stable throughout the ETS period with a mid-term update of the electricity consumption efficiency benchmarks to consider most recent data and production processes.

Limiting exposure of beneficiaries to indirect costs as a % of their GVA

In addition, paragraph 30 in the draft Guidelines introduces the possibility for Member States to further limit the exposure of beneficiaries to indirect costs as a function of their gross value added ("GVA"). This possibility, which is currently included in the Energy & Environment Guidelines (EEAG)[5], is aimed at limiting the exposure of the most electro-intensive sectors for whom indirect carbon costs, when after applying 75% compensation, can make up a disproportionate amount of their GVA. The GVA limitation should be based on benchmark of the best performers.

We strongly welcome this new possibility. A continuation of the current State Aid Guidelines in Phase IV, without the GVA limitation, would not be enough to prevent carbon (and/or investment) leakage for the non-ferrous metals sector, given the high costs we remain exposed to even after the maximum permitted compensation is granted[6]. A more targeted

3 For more details, see the submissions of the Nickel Institute and the European Copper Institute to the public consultation.
4 https://www.ies.be/files/Metals_for_a_Climate_Neutral_Europe.pdf, p. 27, 30
5 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52014XC0628%2801%29
6 Given our electro-intensive nature, the indirect costs of the EU ETS have a major impact on production costs of non-ferrous metals. For example, for primary aluminium production, if the EU ETS carbon price is €30 a tonne, indirect costs alone will represent around 20% of production costs. Therefore,

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

approach, integrating elements from the EEAG, was badly needed in order to create a level playing field between eligible sectors.

However, while the principle of the **GVA limitation is very positive and needs to be maintained, it could be improved by** clarifying that the GVA limitation is at undertaking level (focusing on the undertaking's relevant activities/installations) and who would be eligible for this limitation. We propose that the system be fully aligned with that of the EEAG which gives Member States the option of further **limiting the costs that undertakings with an electro-intensity of at least 20% remain exposed to, to 0.5% of their gross value added**.

c) Regional CO2 factors

The main purpose of the CO2 emission passthrough factor in the Guidelines is to identify the impact of CO2 emission costs on power prices in each market. The draft Guidelines are correctly based on market principles where the emission passthrough factor is delinked from the total electricity generation's greenhouse gas footprint and decided by the price setting technology in each market.

However, emissions pass through factors and geographical areas are intrinsically interlinked and both need to be accurate. The proposal of splitting existing regions in more areas does not provide details on the underlying evidence and contradicts our analysis of greater markets convergence. Furthermore, the overly strict methodology for defining regional areas (1% price divergence in significant number of hours per year) does not capture the reality of energy markets where the emission pass through factor is influenced by neighbouring member states due to interconnections.

More and more intermittent renewable electricity results in more price volatility, hence higher price differences. Indeed, more and more intermittent renewable electricity will mean that prices become more extreme in periods of either power supply excess or shortage, and if these periods coincide with periods with limited transmission capacity, power price differences will be higher than before. This does not mean that markets are becoming decoupled. Consequently, this simplified approach contradicts the market evolution, the intended effects of market coupling and the EU's objectives of completing the internal electricity market.

i. Geographical areas

The draft State Aid Guidelines propose a fragmentation of the current Guidelines' geographical regions. The justification is an assessment in the report accompanying the draft Guidelines that price convergence in the Central and Western Europe (CWE) and Nordic zones has decreased.

Based on our analysis, we disagree with this assessment that convergence has decreased. In fact, cross-border interconnector capacity has consistently increased in the last ten years, and the improved physical connection is amplified by an increased use of flow-based market coupling. Furthermore, there are several factors that result in price differences between markets, as acknowledged by the consultant's report. These include amongst others, limitations in transmission capacity for various reasons (short term incidents, long term maintenance, hydrological situation and of course, an increasing share of intermittent generation. An empirical examination of day-ahead power prices shows more price convergence, not less, in most countries.

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at a level of 75% compensation, indirect costs will represent 16% of a companies' GVA after compensation. This is too high a regulatory burden to bear. Similar figures can be seen for the primary production of other nonferrous metals such as copper, nickel, silicon and zinc (in alphabetical order).

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Price differences as used by the Commission can lead to flawed results if the regions are too small (i.e. when national emission factors are used instead of regional emission factors for connected markets as the Nordics and CWE). Empirical price data reveals that the differences between Finland and Sweden, proposed as a common region, are consistently higher than those for the price zones along the Norwegian- Swedish border. If we apply the Guidelines' own logic, Norway should therefore be included in the Nordic region. More specifically, the Nordic countries have been interconnected with a common price setting mechanisms the last 20-30 years, and there is sufficient information available to re-establish a single factor for this region encompassing Norway, Sweden, Finland and Denmark. Elsewhere, electricity dispatch models and analysis of price correlation between markets and also analysis of short-term limitation of interconnectors reveal that both the Nordic and the CWE region encompassing France, Germany, Belgium, Netherlands, Austria and Germany should be re-established as regions.

ii. Emission passthrough factors

The Commission proposes to continue the current approach by calculating the weighted average of the CO2 intensity of electricity produced from fossil fuels within the defined geographical area / regions for the beginning of Phase IV7.

This methodology is straightforward and has been able to establish reasonable accurate emission factors that are sufficiently reflective of actual pass-through factors in thermal markets. However, this methodology can be very inaccurate when connected areas are defined too small. Having too small of regions would result in a large differential between the carbon pass through values set in the Guidelines and the actual situation which consumers face in the market.

Indeed, for regions with a high proportion of non-fossil power production like Norway, Austria and France, the CO2 emission factor is to a large degree determined by exchange (via interconnectors) with thermal-dominated neighbouring countries. The effect of this segmentation will be that the Guidelines will establish a lower emission passthrough factor than what is actually paid in the market. Therefore, the carbon leakage risk may paradoxically increase for industry located in areas with cleaner power generation.

Recommendation

There are several different approaches to address this inaccuracy. We would suggest policymakers consider the following:

1) There is enough information to re-establish **the Nordic and CWE as regions as in current Guidelines**, reflecting the actual market integration, based on provided information (See the sepataye Eurometaux memo on the regional factors).
2) The Guidelines should **introduce the possibility of using electricity market models** as additional analysis for defining the geographical regions, to be approved by the Commission, in order to obtain the most accurate factors.

Electricity market models can accurately define the factors in countries/regions where the actual pass-through factor is influenced from connected markets and not only from domestic emission-intensive power generation. There is a broad consensus for such models at least in the Nordic market, which is the longest functioning market in Europe.
In our attached memo below, we explain the issue in more detail.

EM memo_ETS
Geographical Regio

[7] The Commission notes that if more data is available, the Commission may revise the methodology from 2025 onwards.

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

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d) Conditional based compensation

Given our electro-intensive nature and the fact that we compete globally based on electricity cost, non-ferrous metals have the strongest inherent incentive to be as energy efficient as possible. Given this, we a priori have reservations about making compensation conditional upon energy efficiency. Nevertheless, we understand the conditionality requirements proposed by the Commission and wish to share the following input.

Paragraphs 53 + 54 describe the conditionality to receive aid. We understand that it is an 'either/or' and not all three requirements need to meet. However, we believe certain modifications to paragraph would make the system more efficient:

a) **Onsite renewable energy generation:** Given the huge amounts of electricity that are needed to produce non-ferrous metals, stipulating that 50% of this energy should come through "on-site renewable energy generation facility" is not even technically feasible (placing a wind park within the site to cover 50% of energy needs would demand a huge, unrealistic amount of space). Non-ferrous metals have signed several large PPAs with wind energy providers in recent years[8], but the investments in wind parks themselves should be done where there is space available for economic investments, the wind resources are readily available, not within industry sites.

b) **Linking with direct emissions (80% share):**

- The objective of compensation for indirects is to reduce the risk of carbon leakage due to the increased electricity prices brought about by the EU ETS. Using a major part, up to 80% of indirects compensation to address direct emissions, is not in line with this objective. Incentives to reduce direct emissions should not be included in this piece of legislation but in other legislation (ETS Directive).
- In addition, requesting that electro-intensive industries use 80% of the electricity price compensation to address direct emissions may not be possible and not in line with the stated intentions of operating aid. Electro-intensive industries have a major part of their investments and challenges linked to energy efficiency and a lower share of costs linked to direct emissions. To give a concrete example, having fully electrified its processes over the past 20-30 years, primary zinc refinery is now fully electrified with 99% of its emissions and only 1% of its emissions direct. Suggest that a zinc refinery should invest 80% of the compensation it receives for indirect carbon costs to address it's negligible 1% direct emissions would be erroneous. In addition, it would give the wrong message on encouraging industrial electrification.

e) Benchmarks

Annex III will define the electricity consumption benchmarks, with paragraph 14.13 outlining the electricity consumption efficiency benchmark and with paragraph 66 outlining that the benchmarks should be updated in 2025. Overall, benchmarks are the best methodology to incentivise energy efficiency and emissions reduction. We believe that

8 For more information on the corporate sourcing of intermittent renewable electricity in the non-ferrous metals sector, please see the following link https://www.ceps.eu/wp-content/uploads/2018/12/Eurometaux%20presentation%20RES%20Corporate%20Sourcing%20CEPS%2029.01.2019.pdf

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

benchmarks should be based on actual data for 10% best performers and thus, disagree with part of the methodology to decide the benchmark.

Benchmarks are the best instrument to incentivise energy efficiency and emissions reduction. We support that the benchmarks be updated in 2025 to take into account technological developments in the sector. We believe that benchmarks should be based on actual data of the 10% best performers (instead of single lowest installation) so that they reflect economic and technical feasibility within the relevant sector.

We support the continuation of current benchmark definitions at Prodcom 8 level. We would recommend that the European Commission, working in tandem with a consultancy company, collect electricity data at Prodcom 8 level with the involvement of respective commodity associations which request them. This would be a similar exercise to the process run in 2011/2012.

Elsewhere, as aforementioned, the GVA limitation should be based on benchmark of the best performers. This will provide further incentivise and ensure that aid is limited.

With regards the fallback benchmarks, the 80% value should not be reduced further. Indeed, it should be noted that even with this level of aid, installations in the fall back benchmark category will only receive 60% of the incurred costs (75% of 80% = 60%).

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Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

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2. Positive elements which should remain in the Final Guidelines

a) Principle of Targeted Aid

We support the principle of targeted aid as describe in Paragraph 16 of the text which states "*aid must be targeted towards a situation where aid can bring about a material improvement that the market cannot deliver itself…the aid must change the behaviour of the undertaking (s) concerned in such a way that it engages additional activity, which it would not carry out without such aid…"*

The primary objective of indirect costs compensation is to prevent carbon leakage due to the indirect costs of the EU ETS. However, due to the reality that sectors and undertakings have different electricity intensity in production, the impact of indirect costs and hence, the carbon leakage risk due to the indirect costs of the EU ETS, varies greatly between undertakings eligible for aid. If the aid is not targeted, the most electro-intensive undertaking, would face a substantially higher risk of carbon leakage. Thus, in order to achieve the stated objective of preventing carbon leakage, targeted aid is needed.

Introducing the principle of targeted aid would send the correct investment signal encouraging the further use of electricity to reduce direct carbon emissions. Furthermore, such an approach would be consistent with the 2050 long-term strategy which promotes the electrification of industry as one of the key pathways to meeting our 2050 decarbonisation objectives[9].

b) Production Level

In our consultation responses, we have consistently said that compensation should be based on previous year's production data. This will ensure that the system is more dynamic and will avoid overcompensation, which is an objective in state aid cases, while providing incentives for the industries growth investments. We welcome that in paragraph 27 (Maximum aid calculations) and paragraphs 14 (11), the Commission define the production level to be compensated based on previous year's compensation.

We fully support this methodology which, as aforementioned, will incentive growth. In addition, such a system will avoid over and under compensation and correct the current system of 5 years historical production which has resulted in not fully accurate compensation levels (Depending on industry's production levels) and thus, not provided incentives for growth.

c) CO2 price

In our consultation responses, we have consistently said that the current CO2 price definition (average of the daily quotation of the EUA forward price of the year t during the year t-1) should be kept. We are pleased to see that in paragraphs 27 and 14.9, the Commission has decided to continue with its current definitions. Such a system will ensure that compensation is neutral to each company' power sourcing strategy.

[9] A Clean Planet for all: A European strategic vision for a prosperous, modern, competitive and carbon neutral economy [COM(2018) 773 final] https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_en.pdf

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d) Update of benchmark and pass-through factor parameters

In our consultation responses, we noted that we fully support that benchmark and emission pass through factors shall be updated in 2025 to consider technology developments and the decarbonisation of the power sector. We support the Commission's proposal to have mid-term updates of both values in 2025.

e) Objectives of the Guidelines

Finally, we would flag that we are pleased that the new Guidelines show an increased understanding of electricity markets and the role of indirects compensation. Many inaccurate statements in the current 2012 Guidelines have been correctly removed.

Some text that has been correctly removed includes:

- **"Degressive Aid":** Degressive Aid has been removed in the new Guidelines. This is correct as it should be noted that degressive aid, from a policy perspective, does not serve any function. Indeed, the decarbonisation of EU electricity markets will ensure that aid beneficiaries do not become dependent. In addition, the new Guidelines have removed the inaccurate working that decreasing aid will give incentives to go from grey to green power. The reality is that indirects compensation has no negative impact on the efficiency of the EU ETS. Power generators face direct emissions costs; therefore, the EU ETS will incentivise further decarbonisation of the power sector, independent of any indirect compensation to energy intensive industry.
- **"Contracts not impacted by CO2":** We welcome that the Commission has removed wording in the previous Guidelines which stated that there might be some contracts not impacted by CO2. The reality in the European market all power prices and contracts are based on market prices and not generation costs. As outlined in the documentation previously submitted to DG Competition, even when signing a PPA with carbon free sources, not ferrous metals still face carbon costs in these contracts.[10]
- **"Internal Market distortions":** We welcome that the Commission has removed the inadequate argumentation that decreasing aid is necessary to reduce internal market distortions. The industry reality is that as price-taker industries, the real distortion is between EU and EU producers. Furthermore, within the EU, according to the Commission's 2018 'State of the EU ETS' report, Member States with compensation schemes in place together account for 70% of EU GDP. With Italy having recently come forward with a scheme, this will bring the number closer to 85%. Looking ahead, new schemes in several Member States (i.e. Romania, etc) are expected in coming years.
    - Elsewhere, the wording of the new ETS-Directive in 10a(6) says "Member States *should* adopt financial measures" whereas the previous version stated that Member States "may adopt".

[10] The exception is in Iceland

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3. Other Elements

a) Level of carbon leakage exposure

We would like to comment that we believe that the RAG rating on pages 33-36 of the consultancy report underestimates the exposure of the non-ferrous metal sectors analysed. Given how electrified our processes are and that our sector's products are traded on global commodity exchanges such as the London Metal Exchange (LME) and/or other global pricing mechanisms, it is clear that the non-ferrous metals sector is the most exposed sector to carbon leakage as a result of the indirect costs of the EU ETS.

Elsewhere, it should be noted that the consultancy analysis is based only on a NACE 4 analysis. Within these NACE 4 codes, we have certain activities (The primary production of non-ferrous metals) which are extremely exposed to carbon leakage. However, basing their carbon leakage exposure on a NACE 4 analysis underestimates the exposure of these undertakings. Details of our exposure are given in Annex 2 where for each non-ferrous metals we outline; 1) electricity costs, 2) indirects costs and 3) indirect cost in % of GVA.

Similarly, it should be noted that more than any other energy intensive sectors, carbon and investment leakage is a phenomenon which has already occurred in the non-ferrous metals sector. Indeed, since 2007, 10 out of 35 primary aluminium smelters have closed in Europe. In these cases, European production being replaced by more CO2 intensive imports with investments being redirected to non-EU areas. Demand is being met by increased imports with EU production declining.

In particular, EU non-ferrous metals production is being replaced with increased Chinese production, which, due to its largely coal based electricity mix, carries a much higher CO2 footprint[11]. To take the example of aluminium production, Chinese production has multiplied tenfold in 20 years and currently represents almost 60% of global production. A similar situation can be viewed for other non-ferrous metal sectors. For example, Silicon production in China has exponentially increased in the last years. Today China is providing twice the world demand and has huge overcapacities.

It is very important to factor in that the carbon footprint for European producers is much lower than our international competitors, especially China. This is due, energy efficiency improvements in recent years and the EU's less carbon intensive electricity mix vis-à-vis our international competitors. To give some concrete figures;

- ✓ In aluminium, the European primary production has among the lowest carbon footprints in the world, amounting to about 7 tCO2/tAl, which is about one third of the respective Chinese footprint and less than half of the global average [12]
- ✓ In Nickel, one tonnes of nickel in Europe is roughly 9 tonnes of CO2. In China, it is 70tonnes of CO2. This is 7.6 times more CO2 intensive[13]
- ✓ In Silicon, one tonne of silicon made in Europe is 3.4 tonnes of CO2. In China, it is 11.6 tonnes. Chinese production is 3.4 times more CO2 intensive[14]

[11] For more information, please see of the 'Metals for a Climate Neutral Europe' report page 26 'Box 2: China's market dominance': **https://www.ies.be/files/Metals_for_a_Climate_Neutral_Europe_0.pdf**

[12] European Aluminium (2018) 'Environmental Profile Report 2018': https://www.european-aluminium.eu/resource-hub/environmental-profile-report-2018/

[13] The Nickel Institute

[14] 2016 AlloyConsult study on CO2 emissions in silicon and manganese ferroalloys for Norsk Industri

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

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b) Transparency & Reporting Requirements

Finally, according to paragraph 61, Member States must publish a report explaining why if compensation exceeds 25% of auction revenue. While we are aware that this is in the agreed the ETS Directive [15] and thus is a requirement, we would just like to flag that this is a strange requirement as there is no relationship between the need for indirects compensation and Member States auctioning income. For example, there are countries with close to emissions-free power generation that will have a relatively low auction revenue but may have a significant share of power-intensive industry, whose power prices are affected by indirect EU ETS costs due to interconnections with other Member States. These countries will clearly need to spend more than 25% of their auction revenues (Which are negligible in the first place).

Elsewhere, it states that the report shall include relevant information on electricity prices. Even if it is stated "without prejudice to requirements regarding the protection of confidential information" it is rather peculiar since it is the indirect cost compensation that is linked to the EU ETS and not electricity prices for undertakings that should be of interest in such a report.

c) EEA Relevance

The first page does not mention the wording 'text with EEA relevance'. This should be added in the final published version.

ABOUT EUROMETAUX

Eurometaux is the decisive voice of non-ferrous metals producers and recyclers in Europe. With an annual turnover of €120bn, our members represent an essential industry for European society that businesses in almost every sector depend on. Together, we are leading Europe towards a more circular future through the endlessly recyclable potential of metals.

Contact: Cillian O'Donoghue, Climate & Energy Director | odonoghue@eurometaux.be | +32 2 775 63 12

[15] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1581688702652&uri=CELEX:02003L0087-20180408

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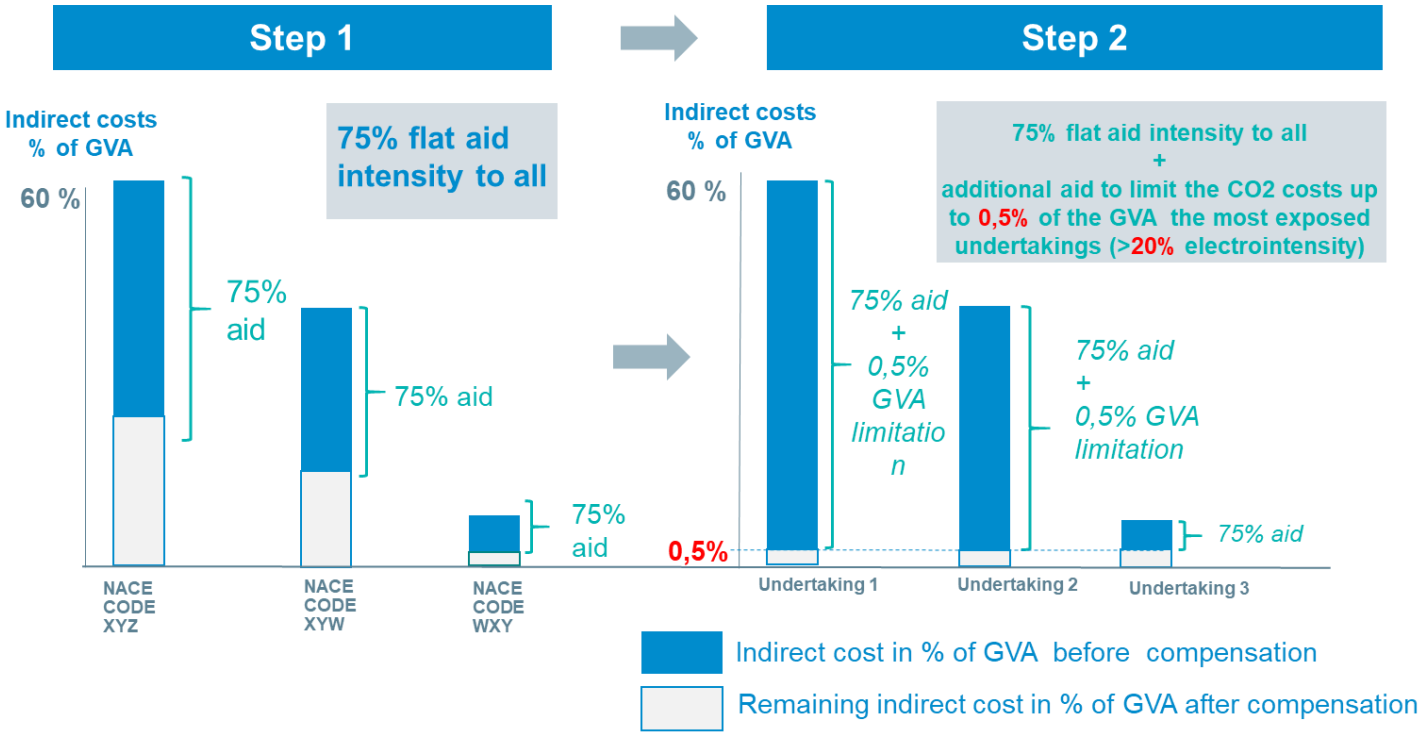
Annex

1. GVA Limitation with Graphs

I. Visual representation of the proposed methodology

Calculation indirect costs proposed methodology to obtain approximately level playing field

We propose to align paragraph 30 with the EEAG: limiting the costs of undertakings with an electrointensity of >20% to 0,5% of their GVA



This would lead to more level playing field between sectors and undertakings. Maximum indirect cost in percentage of GVA is 0, 5 % up to benchmark level (the situation for industries exposed to direct emission is 0,0% direct emission cost in percentage of GVA). However, the most electro intensive industries, will, due to the high intensity, still face the highest indirect cost per ton produced.

Furthermore, all sectors will be treated equally (75%) and undertakings within all sectors with electro intensity above 20% will be treated equally even if the aid intensity might vary (always below 100%).

Eurometaux - European Association of Metals
Avenue de Tervueren 168, Box 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

March 2019

Differentiated Regional CO2 Factors: The importance of getting the Geographical regions correct

In this memo, we provide input to one aspect in the European Commission's draft State Aid Guidelines: ***the geographical regions in the regional pass through factors (Annex III)****.*

We explain how the emission pass through factors and geographical regions are intrinsically linked and thus, to have accurate pass through factors, both need to be accurate. We explain that the effectiveness of the Commission's proxy is dependent on setting the correct geographical regions and how with more intermittent renewables the EU is getting more interconnected but how this increase in intermittent renewables results in more price volatility and hence greater price differentials (greater than the 1% threshold in the Guidelines). If this methodology were employed with too small regions, countries with a high proportion of non-fossil production like Norway, Austria and France in their mix, but for whom the CO2 pass through factor is determined by exchanges (via interconnectors) would be given a very inaccurate factor (A much lower emissions pass through factor than what is actually paid in the market). Therefore, they would be undercompensated, and the threat of carbon leakage would not be addressed adequately, as mandated by the ETS Directive.

The solution for the shortcomings of the methodology is larger geographical regions, in order to more accurately reflect the effect that thermal generation in one country can have on energy prices in another country. We conclude that there is enough available data to re-establish the Nordic and Central West Europe (CWE) as regions as in current Guidelines, reflecting the actual market integration*.*

In the following, we provide an executive summary, followed by a more detailed explanation and then suggested legislative amendments.

Executive Summary

The main purpose of the CO2 emission passthrough factor in the Guidelines is to identify the impact of CO2 emission costs on power prices in each market. The draft Guidelines are correctly based on market principles where the emission passthrough factor is delinked from the total electricity generation's greenhouse gas footprint and decided by the price setting technology in each market.

However, emissions pass through factors and geographical areas are intrinsically interlinked and both need to be accurate. The proposal of splitting existing regions in more areas does not provide details on the underlying evidence and contradicts our analysis of greater markets convergence. Furthermore, the overly strict methodology for defining regional areas (1% price divergence in significant number of hours per year) does not capture the reality of energy markets where the emission pass through factor is influenced by neighbouring member states due to interconnections. More and more intermittent renewable electricity results in more price volatility, hence higher price differences. Indeed, more and more intermittent renewable electricity will mean that prices become more extreme in periods of either power supply excess or shortage, and if these periods coincide with periods with limited transmission capacity, power price differences will be higher than before. This does not mean that markets are becoming decoupled. Consequently, this simplified approach contradicts the market evolution, the intended effects of market coupling and the EU's objectives of completing the internal electricity market.

a. Geographical areas

The draft State Aid Guidelines propose a fragmentation of the current Guidelines' geographical regions. The justification is an assessment in the report accompanying the draft Guidelines that price convergence in the Central and Western Europe (CWE) and Nordic zones has decreased.

Based on our analysis, we disagree with this assessment that convergence has decreased. In fact, cross-border interconnector capacity has consistently increased in the last ten years, and the improved physical connection is amplified by an increased use of flow-based market coupling. Furthermore, there are several factors that result in price differences between markets, as acknowledged by the consultant's report. These include amongst others, limitations in transmission capacity for various reasons (short term incidents, long term maintenance, hydrological situation and of course, an increasing share of intermittent generation. An empirical examination of day-ahead power prices shows more price convergence, not less, in most countries.

Price differences as used by the Commission can lead to flawed results if the regions are too small (i.e. when national emission factors are used instead of regional emission factors for connected markets as the Nordics and CWE). Empirical price data reveals that the differences between Finland and Sweden, proposed as a common region, are consistently higher than those for the price zones along the Norwegian- Swedish border. If we apply the Guidelines' own logic, Norway should therefore be included in the Nordic region. More specifically, the Nordic countries have been interconnected with a common price setting mechanisms the last 20-30 years, and there is sufficient information available to re-establish a single factor for this region encompassing Norway, Sweden, Finland and Denmark. Elsewhere, electricity dispatch models and analysis of price correlation between markets and also analysis of short-term limitation of interconnectors reveal that both the Nordic and the CWE region encompassing France, Germany, Belgium, Netherlands, Austria and Germany should be re-established as regions.

b. Emission passthrough factors

The Commission proposes to continue the current approach by calculating the weighted average of the CO2 intensity of electricity produced from fossil fuels within the defined geographical area / regions for the beginning of Phase IV[1].

This methodology is straightforward and has been able to establish reasonable accurate emission factors that are sufficiently reflective of actual pass-through factors in thermal markets. However, this methodology can be very inaccurate when connected areas are defined too small. Having too small of regions would result in a large differential between the carbon pass through values set in the Guidelines and the actual situation which consumers face in the market.

Indeed, for regions with a high proportion of non-fossil power production like Norway, Austria and France, the CO2 emission factor is to a large degree determined by exchange (via interconnectors) with thermal-dominated neighbouring countries. The effect of this segmentation will be that the Guidelines will establish a lower emission passthrough factor than what is actually paid in the market. Therefore, the carbon leakage risk may paradoxically increase for industry located in areas with cleaner power generation.

Recommendation

There are several different approaches to address this inaccuracy. We would suggest policymakers consider the following:

1) There is enough information to re-establish the Nordic and CWE as regions as in current Guidelines, reflecting the actual market integration, based on provided information (See 'recommendations' box of page 8 for further details).
2) The Guidelines should introduce the possibility of using electricity market models as additional analysis for defining the geographical regions, to be approved by the Commission, in order to obtain the most accurate factors.

Electricity market models can accurately define the factors in countries/regions where the actual pass-through factor is influenced from connected markets and not only from domestic emission-intensive power generation. There is a broad consensus for such models at least in the Nordic market, which is the longest functioning market in Europe.

In the next section, we explain the issue in more detail.

[1] The Commission notes that if more data is available, the Commission may revise the methodology from 2025 onwards.

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A more detailed explanation of the inaccuracies of the Commission's proposed geographical regions

a. Geographical areas

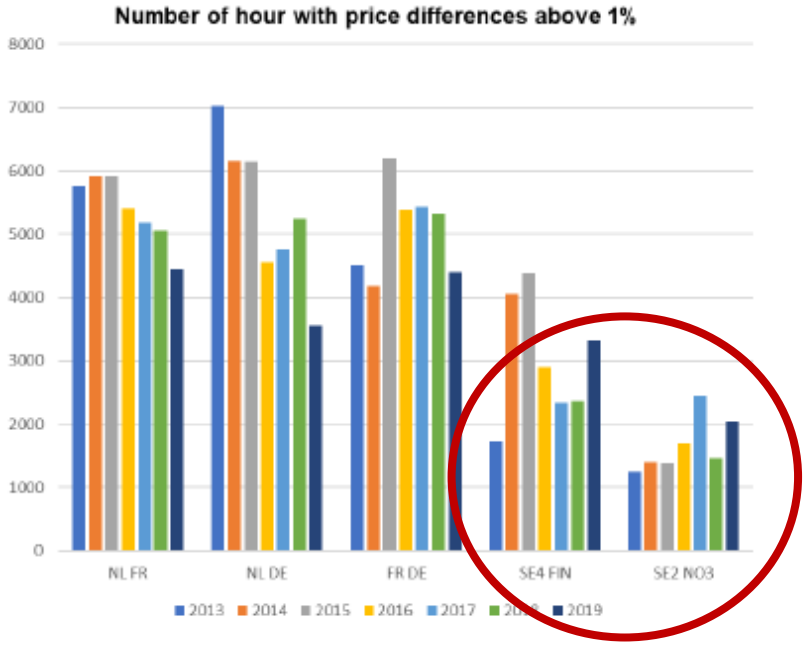
The main purpose of the CO2 emission passthrough factor in the Guidelines is to identify the impact of CO2 emission costs (EUA allowances price) on power prices in each region. The draft Guidelines are correctly based on market principles where the emission passthrough factor is delinked from the total electricity generation's greenhouse gas footprint and decided by the price setting technology in each market. However, the regions defined in the draft Guidelines don't lead to accurate emission passthrough factors.

EU's power markets are getting more interconnected but more intermittent renewable power generation can give higher price differences

The draft State Aid Guidelines propose a fragmentation of the current Guidelines' power market regions. The justification is an assessment in a report accompanying the draft Guidelines that price convergence in the Central and Western Europe (CWE) and Nordic zones has decreased.

However, our analysis contradicts this assessment. In reality, cross-border interconnector capacity has consistently increased in the last ten years, and the improved physical connection is amplified by an increased use of flow-based market coupling.

Empirical price data reveals that the differences between Finland and Sweden, proposed as a common region, are consistently higher than those for the price zones along the Norwegian- Swedish border. By the draft Guidelines' own logic, Norway should therefore also be included in the Nordic region. Indeed, the Nordic power markets are inherently similar, are highly interconnected, trade on the same power exchange and follow the same rules. Denmark is thus also a natural part of the Nordic market.



Source: Power exchanges

Price differences as used by the Commission can be an inaccurate proxy for establishing regional vs national emission passthrough factors, since there are several factors that result in price differences between markets, such as short- or

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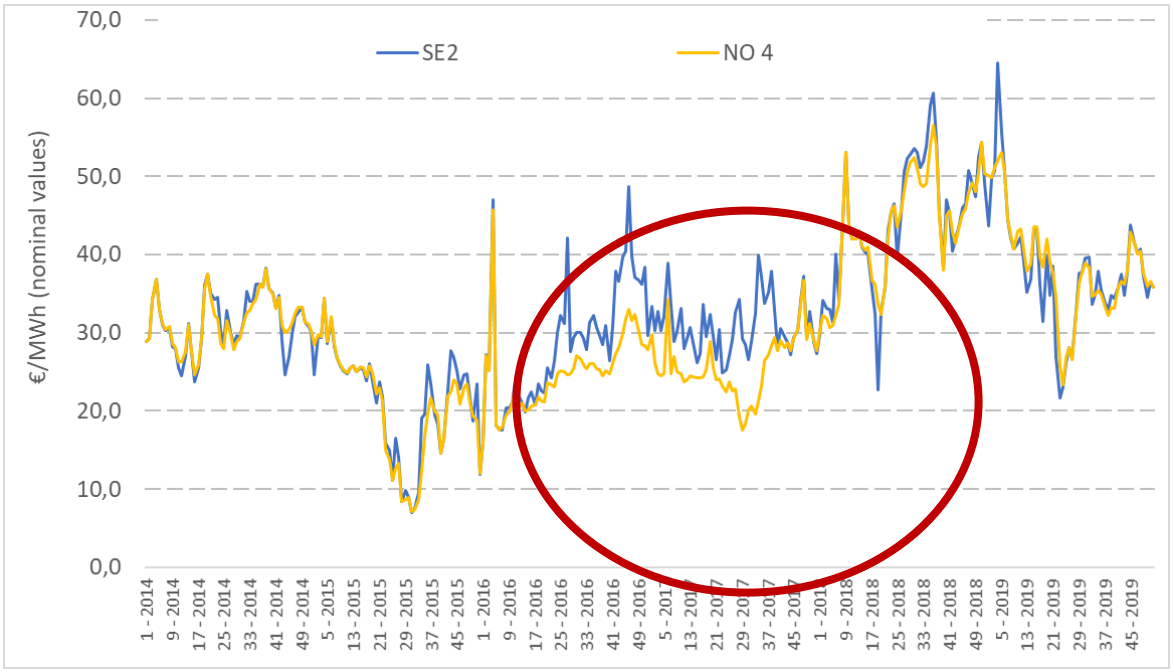
longer-term limitations of physical interconnection capacity; introduction of more intermittent renewables increase the price volatility and hence the price differences (see the Report accompanying the Guidelines at page 56 and 57). For regions with a high proportion of non-fossil power production such as the Nordics, Austria and France, the CO2 emission factor is mainly determined by exchange (via interconnectors) with thermal-dominated neighboring countries. More specifically, the Nordic countries have been interconnected with a common price setting mechanisms the last 20-30 years, and there is sufficient information available to re-establish a single factor for this region encompassing Norway, Sweden, Finland and Denmark. Elsewhere, the CWE region encompassing France, Germany, Belgium, Netherlands, Austria and Germany should be also re-established as a single region.

Why price correlation should be used as additional analysis for the Nordic and CWE region

Estimating price homogeneity between markets by counting the number of hours with price differences exceeding 1% is too crude in that it risks attributing market characteristics on single non-representative events. One example is the price difference between Norway and Sweden. This difference was largely down to an uncharacteristic large difference in prices between the northern Norwegian and northern Swedish price zones in 2016 and 2017. Prices in these two regions is shown in the figure below.



Source: Nord Pool

After a period of similar prices, price divergence intensified in 2016 and 2017 before reverting to the trend of being more similar. The price differences above were attributable to a number of interconnector outages between several Norwegian-Swedish interconnectors, see figure below.

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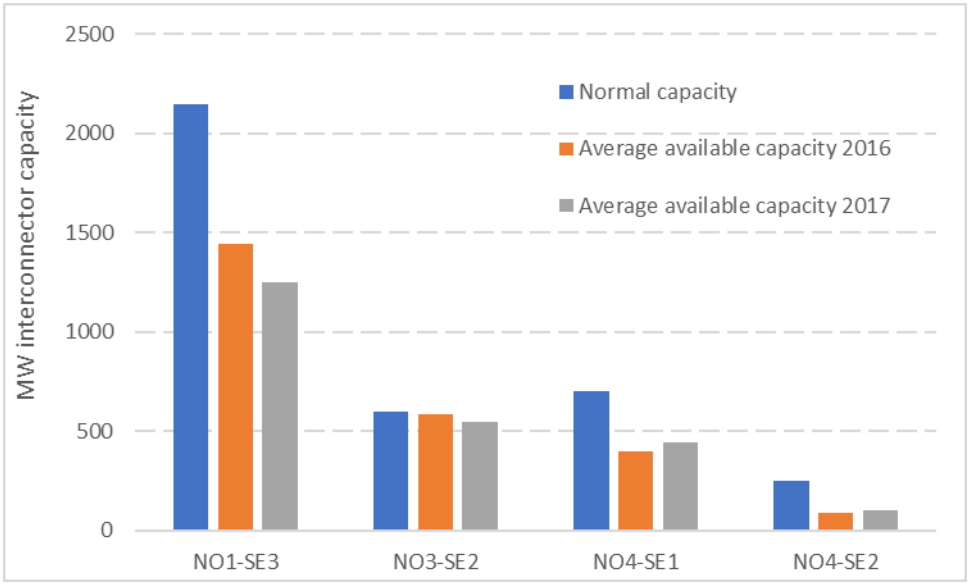

Source: NVE

When transmission lines are fully available, prices are broadly similar even in years with considerable intermittent generation, as in 2018. The price difference methodology proposed by the Commission risks assigning too much weight to anomalies and less to business-as-usual situations and actual market mechanisms.

Another metric for measuring price homogeneity for these two regions (Nordics and CWE) is not the absolute price differences, but an indication of how much they affect each other, i.e. evaluating how prices correlate. This measures how the price in one market influences the price in another and thus also to which extent the CO2 element in one country spills over to another. Bottlenecks between the countries do occur in specific situations. Examples are situations with either ample wind generation or unexpected shutdowns of generation or (unexpected) limitations on interconnectors occur. These markets will not have equal prices until the transmission capacity between them is not a limiting factor and all bottlenecks are removed. However, this is not economically viable as it would require excessive investments in transmission capacity and it is also not the case internally in countries, where there are many bottlenecks at any time but the price is kept equal through interventions in the power market.

The emission factor is “traded” through market coupling and therefore also taking price correlation into consideration can lead to more accurate results than only looking at price differences for these two markets. If these regions are defined too small, then the intended effect of market coupling is not correctly considered.

In the graphs below we observe a strong price covariance between Sweden Norway, Finland.

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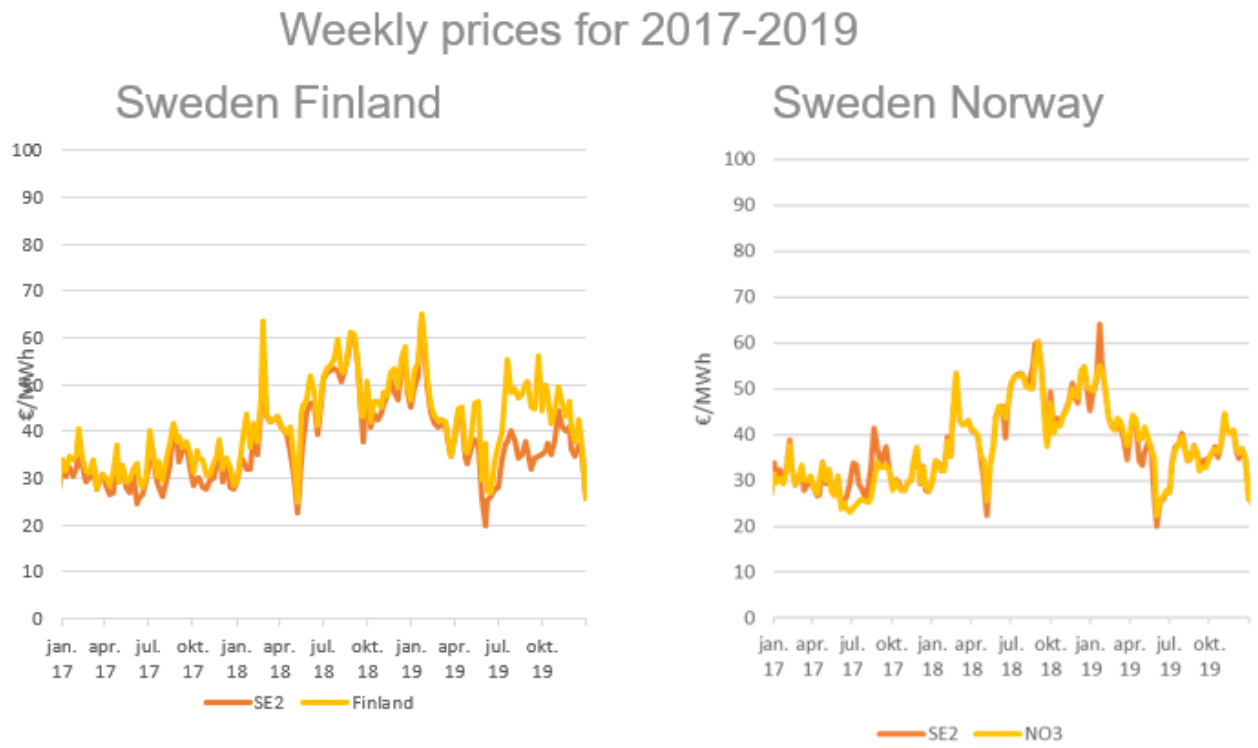

Such correlation observed in the graph can be measured as correlation factors. This correlation can be expressed in correlation tables where a high factor indicates integrated markets.

	Sweden	Norway	Denmark	Finland	Poland	Germany	Austria	Netherlands	France	UK
Sweden*	1.00	0.96	0.90	0.90	0.61	0.72	0.74	0.78	0.50	0.42
Norway**	0.96	1.00	0.85	0.83	0.63	0.66	0.70	0.76	0.46	0.41
Denmark	0.90	0.85	1.00	0.84	0.75	0.84	0.83	0.75	0.48	0.37
Finland	0.90	0.83	0.84	1.00	0.75	0.64	0.67	0.65	0.37	0.21
Poland	0.61	0.63	0.75	0.75	1.00	0.60	0.63	0.53	0.23	0.09
Germany	0.72	0.66	0.84	0.64	0.60	1.00	0.96	0.83	0.76	0.44
Austria	0.74	0.70	0.83	0.67	0.63	0.96	1.00	0.84	0.76	0.39
Netherlands	0.78	0.76	0.75	0.65	0.53	0.83	0.84	1.00	0.81	0.64
France	0.50	0.46	0.48	0.37	0.23	0.76	0.76	0.81	1.00	0.53
UK	0.42	0.41	0.37	0.21	0.09	0.44	0.39	0.64	0.53	1.00

*) SE2, **)NO3,

It is clear from the graphs and tables that we can observe strong correlation between Sweden Norway, Finland and Denmark, and furthermore, Central West Europe is another connected region with common price setting and not national areas as the draft proposal.

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Recommendation

For more accurate definition of geographical areas, we recommend the following:

For the Nordics and Central West Europe, only looking at price differences is not the best proxy for establishing regional passthrough factors.

This is for the following reasons:

i. Firstly, price level (differences) depends on several factors and give marginal information on emission passthrough from the price-setter (marginal plant in the merit order).

ii. Secondly, there will always be price differences between areas, particularly in periods with limited transmission capacity, and the only way to completely eradicate price differences, i.e. to bring price differences down to below 1%, is to build so much transmission capacity that it is never fully used. This is not economically viable. Therefore, a price difference cannot (and should not) be entirely eradicated.

iii. Thirdly, although there are price differences between countries, the marginal price setter can be the same and impacting on price changes in both countries**.**

Instead, in order to more accurately investigate the level of integration of the Nordic markets and also CWE, additional analysis should be undertaking in order to consider how much they affect each other, and this is done by evaluating how prices correlate. This is a measure of the extent to which the price in one market influences the price in another and thus also to which extent the CO2 element in one country spills over to another. Our analysis shows that the regions should be the same as in current Guidelines reflecting the market integration. This means the reestablishment of the Nordic region (Strong correlation between Sweden Norway, Finland and Denmark) and the Central west Europe region (Strong correlation between France, Germany, Belgium, the Netherlands and Luxembourg).

b. Emission passthrough factors

The Commission proposes to continue the current simplified approach by calculating the weighted average of the CO2 intensity of electricity produced from fossil fuels within the defined geographical area/regions. This methodology is straightforward and has been able to establish reasonable accurate emission factors in Phase III given that the regions were accurate. However, the values may be very inaccurate when areas are defined too small and in contradiction to the actual markets the consumers meet, especially in countries with high shares of carbon free generation, where the actual pass-through factor comes from price influence from connected markets (such as the Nordics, Austria, France and others).

i. Price setting Nordic market

In markets with a large share of hydropower and nuclear, like the Nordic power market, price setting is more complex. The Nordic market is dominated by hydro power with significant reservoir capacity, and the region is interconnected with the continental market through interconnectors of significant capacity. Only a minor fraction comes from thermal generation within the Nordic market, and most of the power supply is free of CO2 emissions (But not CO2 cost). Nevertheless, CO2 prices play a significant role in the price formation of this market, through coal power production in Sweden, Denmark and Finland, and through interconnections with the Continent. In fact, hydro power does not have a cost in itself, but reflect the alternative price of power in the market (defined as water value), which is variable fossil-based power production either in the same country or in other countries via interconnectors. In broad terms, continental thermal power plants influence the price level in the Nordic market as well as part of CWE region and is a significant driver of the

prices. To observe and establish the emission passthrough factor for the Guidelines in such complex markets, the Commissions methodology will be inaccurate with national factors.

ii. Price setting Continental markets

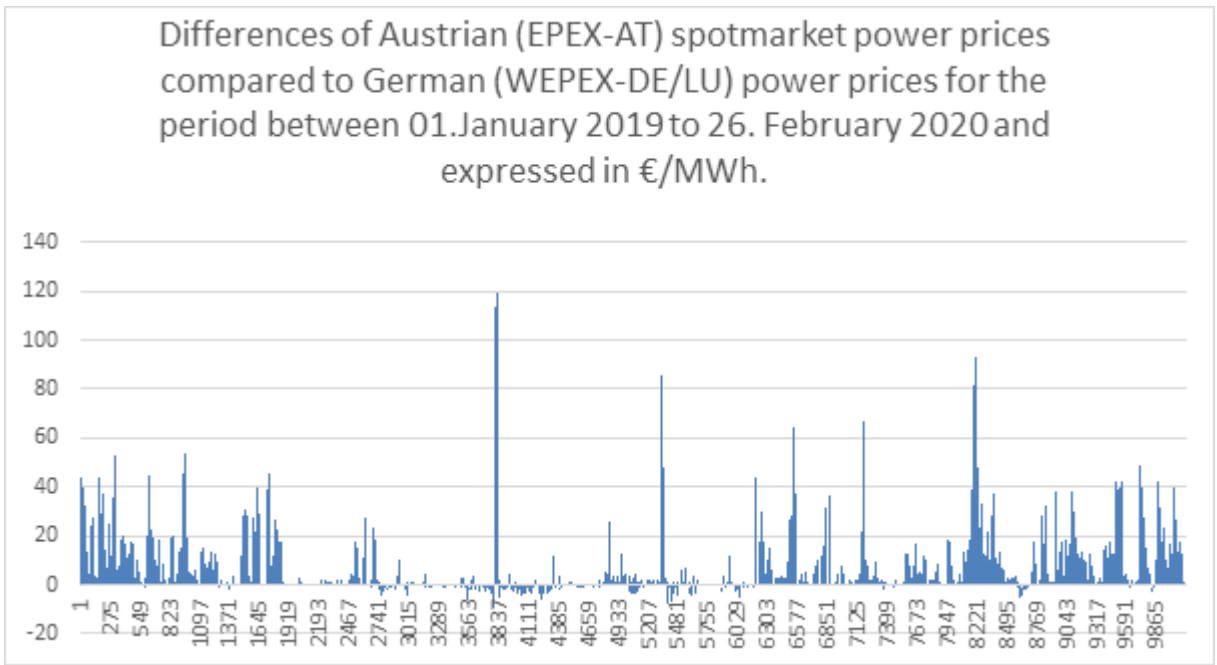
In some part of Europe, fossil fuel plants are setting the price in the vast majority of hours. The wholesale power prices are driven by several factors where the short-run marginal cost of thermal power is the main driver (driven by commodity prices coal, gas, and CO2). Emission cost adds to the marginal plants cost and thus to the price. The Commission's simplified methodology, given that the regions were larger, has proven to be accurate in these markets in Phase III.

a. Focus on Austria

Another example for a bottleneck is when regulatory capacity restrictions result in artificial limited interconnection between neighbor countries. Looking at the situation between Germany and Austria, one finds that in the overwhelming majority of time the power prices are identical or higher in Austria. This must be viewed against the background of the physical capacity restraints in the north-south axis in Germany and the regulatory capacity restriction between Germany and Austria. Obviously, in times of price-identity, the German CO2-intensity is embedded also in the Austrian power prices. Furthermore, during these periods the German CO2-intensity is around the higher end of the German CO2-intensity spectrum.

This is because, whenever there are very low German power prices, this is due to a surplus of electricity supply in Germany, very often caused by additional renewable capacities delivering to the grid due to favorable weather conditions. In such situations demand from Austria rises as consumers want to reap the benefit of lower German electricity prices. However, because of the recently interposed price zone separation of Germany and Austria (which has it physical cause in the capacity restraints in the north-south axis in Germany), this surplus electricity (and its low CO2-price element) is not entirely available in Austria. In such situations, re-dispatch measures will lead to the ramp-up of production in Austrian power plants, which, naturally, in Austria, adds a premium to the German power prices.

An example of this effect is provided below:



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Consequently, in the vast majority of times, when German and Austrian process are identical or the Austrian prices are higher, the German CO2-price element is embedded in Austrian power prices. The root of this effect is the asymmetrical power transmission and price mechanism of the two countries reflecting limited power transmission capacities primarily already within Germany and at the Austrian-German border.

This is not reflected by the two criteria used to define geographical regions and frustrates the primary objective of the ETS-compensation scheme, namely, that the emission factor used for the amount of the aid calculation should reflect the pass-through of ETS costs into the electricity consumed in a given area.

b. Focus on Belgium

Similarly, in contradiction to the consultancy report accompanying the draft Guidelines stating that price convergence in the Central and Western Europe (CWE) has decreased, price convergence has gone up for the following reasons:

- Belgium is a small country where the interconnection capacity is almost 50% of the peak capacity and thus Belgian market prices are highly impacted by the prices of neighbouring countries – see tables below.
- Cross-border interconnector capacity has increased in the past years, and amplified by an increased us of flow-based market coupling.
- More interconnection capacity is planned, e.g. Allegro. Indeed, in its latest adequacy report, the Belgian transmission grid operator Elia states the following; “It is important to note that even though the contribution of additional interconnections and additional cross-border capacity to adequacy can be limited – depending on the situation in neighbouring countries –, the most important benefit those investments bring are price convergence, in turn leading to improved overall welfare. Interconnections allow for an optimal sourcing of electricity from an integrated European market (all year long) and for a maximal utilization of renewable energy sources despite their natural intermittency.”

On an hourly basis, prices can however be very volatile:

- more and more intermittent renewable electricity, with increasing hours of negative prices
- short-term limitations in transmission capacity for various reasons (short term incidents e.g. nuclear power plants, long term maintenance, hydrological situation).

We also would like to stress that fully equal prices on an hourly basis between these countries cannot be an objective as such, as this would require excessive investments in transmission capacity which would not be economically viable (and is also not the case internally in countries, where there are many bottlenecks at any time but the price is kept equal through interventions in the power market).

The overly strict definition of 1% (hourly) price divergence based on absolute price differences contradicts the market evolution and does not contribute to the most efficient sourcing of electricity in an integrated European electricity market.

A more accurate metric for price homogeneity is be correlation, i.e. how prices in one market influence prices in another and thus also to which extent the CO2-element in one country spills over to another. However, the correlation based on monthly averages instead of hourly day-ahead power exchange prices (which can be very volatile due to exceptional circumstances) would be a more correct indicator as it clearly reflects the average price an industrial consumer is facing.

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Avenue de Tervueren, 168/bte 13 | B-1150 Brussels | Tel: +32 (2) 775 63 11 | www.eurometaux.eu | eurometaux@eurometaux.be | @Eurometaux

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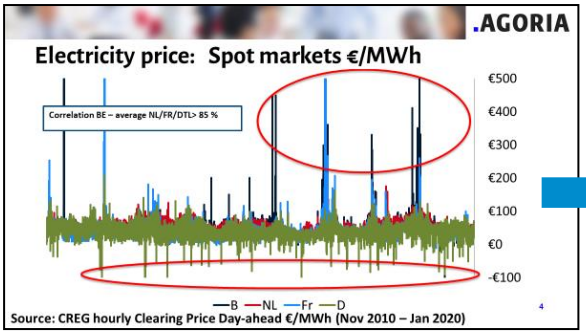
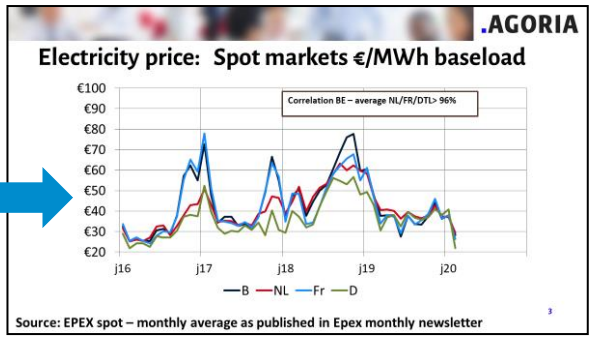
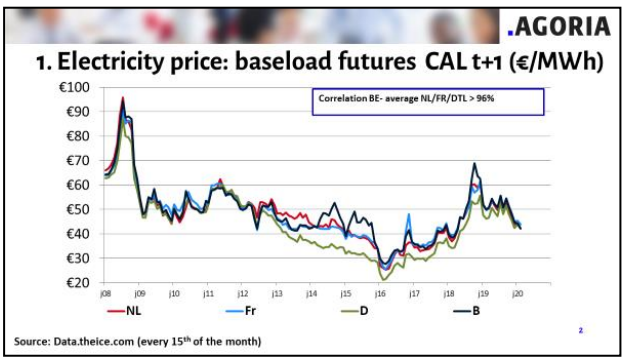




In addition to day-ahead contracts, many industrial companies also conclude contracts in the futures market, e.g. year-ahead (CAL+1), two-year-ahead (CAL+2) etc. Therefore, in our opinion there is no reason to not take into account the price convergence or correlation of (average) year-ahead prices, which is more than 96% since 2008.



c. Focus on France

Using a per country analysis for France would not be suitable considering:

i. The specificities of the French mix, with a very low carbon production mix (less than 0,5 t CO2 /MWh in 2018) which is not the marginal asset. Neighboring markets + large hydro (priced on the basis of fuels assets) have been the marginal asset 50 to 90% of the time since 2010.

ii. The high integration level of the different countries in the CWE zone, with a strict convergence of more than 40% in 2019 and a trend which is supported by new cross border capacities.

iii. The high level of correlation between power prices within the CWE zone.

iv. The econometric assessment made by Compass Lexecon1 confirmed that the relevant zone to compute carbon emission factor for France is CWE.

Given these four factors, a CWE Region would be the relevant zone to determine the France pass-through factor.

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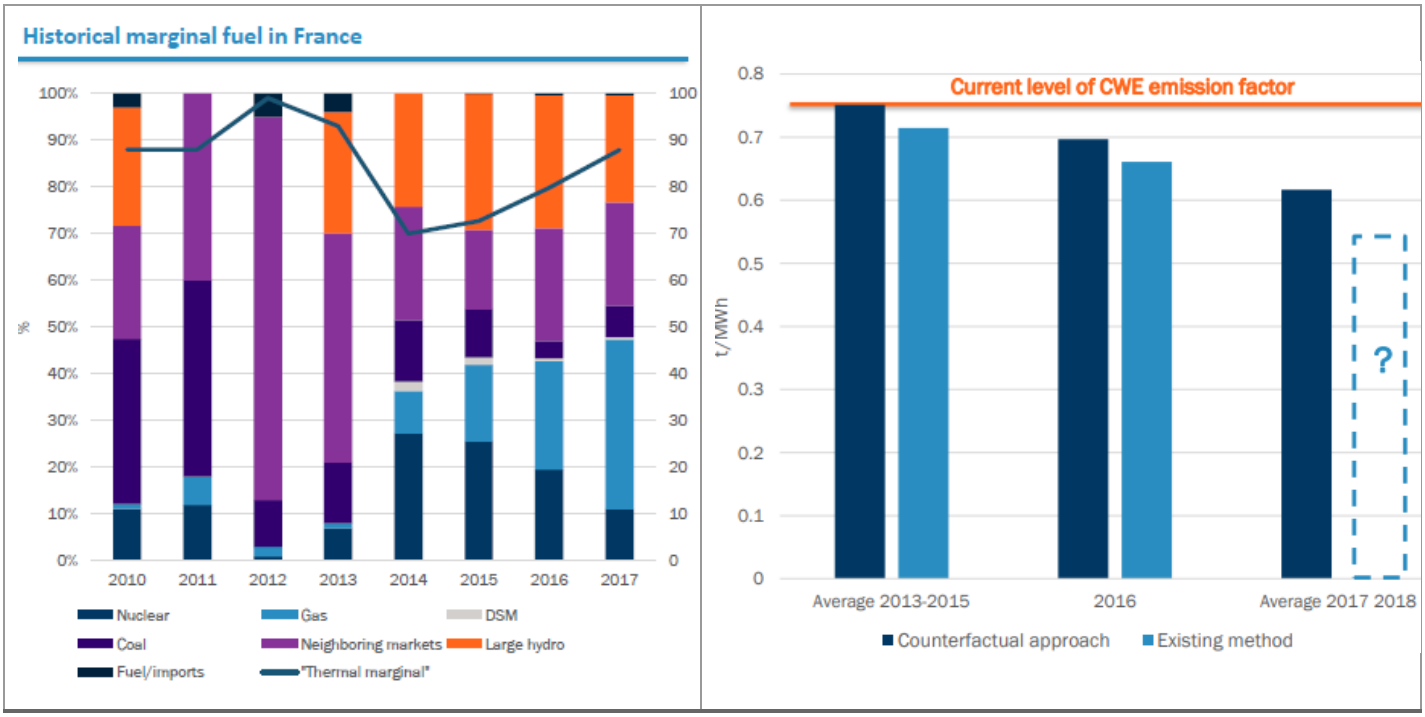

Source: FTI-CompassLexecon, 2019[2]

Elsewhere, provided it is applied to the CWE, the proxy used by the Commission is relevant to calculate the emissions factor. As confirmed in the Compass Lexecon is their report, such methodology is relevant only for zones with a high percentage of fossil fuels in their mix and not for a country like France.

Why electricity market models could and should be used for the Nordics and CWE region

Electricity market model can describe more accurately the actual situation market convergence with respect to defining common emission passthrough factor. In 2012 impact assessment the Commission stated thaTherefore,ide electricity market model could have been used to assess the emission passthrough factors, however, such model was not available in 2012. Today in 2020, several consultancy companies can provide EU wide electricity market models (see the Report page 56 …" There are a number of dispatch models that could be used to simulate emission factors but no reference that would establish a European consensus. We also identified a number of practical limitations associated with the potential use of these models to apply the marginal approach…".

Furthermore, at page 59 *"The main limitation of this approach is the availability of such data for all European markets. For most Member States, the information regarding marginal units is not directly available from results provided by the power exchanges after the day-ahead market"*

We agree there might be some practical limitations and that information is not directly available from exchanges nor Member States. However, electricity market models can provide accurate information on complex market pricing. Electricity market models can accurately define the factors in countries/regions where the actual pass-through

[2]Source: **https://www.fticonsulting.com/fti-intelligence/energy/research/carbon/analysis-co2-power-emission-factor-indirect-compensation-related-eu-ets**

factor is influenced from connected markets and not only from domestic emission-intensive power generation. There is a broad consensus for such models at least in the Nordic market, which is the longest functioning market in Europe. Therefore, the Guidelines should allow for electricity market models to be used as additional analysis, in order to obtain the most accurate numbers.

Recommendation

For more accurate definition of emission passthrough factor, we recommend the following:

i. The proposed methodology is sufficient to define the passthrough factor, so long as the regions are accurately defined.

ii. The methodology gives inaccurate results if areas are defined wrongly too small and where the factor is impacted by neighboring areas. Therefore, electricity market models could be used as additional analysis in cases where the actual pass-through factor comes from price influence from connected markets and not from domestic emission-intensive power generation.

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Annex. Legislative Amendments

We propose the following text:

Paragraph 14.10	Proposed new text
'CO2 emission factor', in tCO2/MWh, means the weighted average of the CO2 intensity of electricity produced from fossil fuels in different geographic areas. The weight shall reflect the production mix of the fossil fuels in the given geographic area. The CO2 factor is the result of the division of the CO2 equivalent emission data of the energy industry divided by the gross electricity generation based on fossil fuels in TWh. For the purposes of these Guidelines, the areas are defined as geographic zones (a) which consist of submarkets coupled through power exchanges, or (b) within which no declared congestion exists and, in both cases, hourly day-ahead power exchange prices within the zones showing price divergence in euros (using daily ECB exchange rates) of maximum 1 % in significant number of all hours in a year. Such regional differentiation reflects the significance of fossil fuel plants for the final price set on the wholesale market and their role as marginal plants in the merit order. The mere fact that electricity is traded between two Member States does not automatically mean that they constitute a supranational region. Given the lack of relevant data at sub-national level, the geographic areas comprise the entire territory of one or more Member States. On this basis, the following geographic areas can be identified: Nordic (Sweden and Finland), Baltic (Lithuania, Latvia and Estonia), Iberia (Portugal and Spain), Czechia and Slovakia (Czechia and Slovakia) and all other Member States separately. The corresponding maximum regional CO2 factors are listed in Annex III. In order to ensure equal treatment of sources of electricity and avoid possible abuses, the same CO2 emission factor applies to all sources of electricity supply (auto generation, electricity supply contracts or grid supply) and to all aid beneficiaries in the Member State concerned.	*'CO2 emission factor', in tCO2/MWh, means* ***the impact of CO2 emission costs on power prices in each market and reflects the price-setting technology. In areas were the actual pass-through factor comes from price influence from connected areas and not only from thermal generation within the area, it can be defined by using additional analysis based on electricity markets models in areas where the actual pass-through factor comes mainly from thermal generation within the area then CO2 emission factor'****, in tCO2/MWh, means the weighted average of the CO2 intensity of electricity produced from fossil fuels in different geographic areas. The weight shall reflect the production mix of the fossil fuels in the given geographic area. The CO2 factor is the result of the division of the CO2 equivalent emission data of the energy industry divided by the gross electricity generation based on fossil fuels in TWh. For the purposes of these Guidelines, the areas are defined as geographic zones (a) which consist of submarkets coupled through power exchanges, or (b) within which no declared congestion exists and, in both cases,* ***where the*** *hourly day-ahead power exchange prices within the zones showing price divergence in euros (using daily ECB exchange rates) of ~~maximum 1 % in~~ significant number of all hours in a year,* ***or c) for current regions CWE and Nordic, where short term limitations on interconnectors resulting in larger price differences and calculations of the covariances between areas is analyzed.*** *Such regional differentiation reflects the significance of fossil fuel plants* ***and for CWE and Nordic areas also reflects the impact from abroad,*** *for the final price set on the wholesale market and their role as marginal plants in the merit order. The mere fact that electricity is traded between two Member States does not automatically mean that they constitute a supranational region. ~~Given the lack of relevant data at sub-national level,~~ the geographic areas comprise the entire territory of one or more Member States. On this basis, the following geographic areas can be identified: Nordic* ***(Norway, Denmark, Sweden and Finland), Central-West Europe (Austria, Belgium, Luxembourg, France, Germany and Netherlands),*** *Baltic (Lithuania, Latvia and Estonia), Iberia (Portugal and Spain), Czechia and Slovakia (Czechia and Slovakia) and all other Member States separately. The corresponding maximum regional CO2*

Eurometaux - European Association of Metals
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	factors are listed in Annex III ***or factors decided by using additional analysis based on electricity markets models on request from Member States and approved by the Commission.*** *In order to ensure equal treatment of sources of electricity and avoid possible abuses, the same CO2 emission factor applies to all sources of electricity supply (auto generation, electricity supply contracts or grid supply) and to all aid beneficiaries in the Member State concerned;*
Justification: Please see the above explanation.	

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